DOCUMENT RESUME

ED 324 413 CE 055 847

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TITLE Agricultural Education Needs of Farmers in Santa Barbara County, Venezuela. Summary of Research 59.
INSTITUTION Ohio State Univ., Columbus. Dept. of Agricultural Education.
PUB DATE 90
NOTE 9p.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Adult Education; Agricultural Education; *Agricultural Machinery; *Educational Needs; *Extension Education; *Farmers; Foreign Countries; *Information Sources; *Teaching Methods
IDENTIFIERS *Venezuela

ABSTRACT

A study identified the perceived agricultural education needs of farmers in Santa Barbara County, Venezuela and determined the extension teaching techniques most preferred by the farmers as well as the most suitable time of the year and preferred location for receiving technical training. Data were collected from 276 farmers through face-to-face structured interviews during April and May 1989. The interview instrument was in Spanish. Four major conclusions were drawn from the findings: (1) the highest educational needs were in machinery management and crop production; (2) the educational needs scores and the demographic variables of the farmers are independent of one another; (3) farmers prefer on-site farm visits, field demonstrations, and radio programs for receiving technical information; and (4) farmers prefer to receive technical information at their own farms during the summer months. (7 references) (CML)

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Summary of Research

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Agricultural Education Needs of Farmers in Santa Barbara County, Venezuela

Juan F. Rodriguez and Janet L. Henderson

Introduction

Determining the knowledge level of the people for whom educational programs are being planned is an important step in the planning process. The lack or omission of planning can result in programs which are not appropriate for the intended audience (Androulidakis, 1988). Educational programs can be designed to help farmers increase their skills and knowledge and enable them to use new agricultural technology. The use of human and monetary resources becomes effective and efficient.

In Venezuela, as in many Latin American countries, all organizations make plans, but not all organizations may engage in systematic planning. Planning decisions are based on institutional, political, traditional, and/or personal preferences. However, one of the best ways to begin the planning process is to assess the needs of clients (Witkin, 1984). The educational needs of farmers are not always determined or considered when planning programs. By knowing the educational needs of farmers, Extension personnel will be able to develop appropriate programs for farmers.

Purpose and Objectives

This study was designed to identify the perceived agricultural education needs of farmers in Santa Barbara County, Venezuela. The study also was designed to determine the Extension teaching techniques most preferred by the farmers and the most suitable time of the year and preferred location for receiving technical training.

In this study, six objectives were developed:

1. To identify the demographic characteristics of farmers in Santa Barbara County: age, levels of formal and informal education, land tenure, size of farm, years of farming experience, and distance from farm to Extension office;
2. To determine the perceived educational needs of farmers in four major areas of agriculture: livestock production, crop production, machinery management, and farm management;
3. To determine the relationships between selected demographic characteristics of the farmers and their perceived educational needs in the four major agricultural areas;
4. To identify the Extension teaching techniques most preferred by the farmers;
5. To determine the relationships between selected demographic characteristics and preferred Extension teaching techniques;
6. To determine the most suitable time of the year and preferred location for receiving technical training.

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Methodology

Descriptive correlational research was used in this study. The target population consisted of all the farmers situated in Santa Barbara County. The accessible population was the 1,028 farmers included in the list developed by the Ministry of Agriculture for the county. The sample consisted of 276 farmers randomly selected from that list of farmers.

An instrument was developed to collect data by means of a face-to-face interview. The instrument consisted of three parts. Part one was designed to determine educational needs by collecting data on the farmers' perceptions of the level of importance and the amount of knowledge in four major agricultural areas: livestock production (23 items), crop production (36 items), machinery management (6 items) and farm management (6 items). The Borich formula (1980) was used to calculate the perceived educational needs as follows: En = (In - Kn) ig; where En = educational need, In = the level of importance of each item as rated by the farmer, Kn = the perceived amount of knowledge that the farmer possesses of each item, and ig = the average mean score of the relative importance of an item as rated by all the farmers. Part two of the instrument was developed to secure data on farmers' preference for specific agricultural Extension teaching techniques. Part three was designed to gather data on demographic characteristics of the respondents. The instrument was tested for face and content validity by a panel of experts in the Department of Extension Service, Ministry of Agriculture in Venezuela. The instrument was translated into Spanish by the researcher and revised by the panel of experts in Venezuela. Field testing was conducted to assure the instrument's validity. The reliability for the instrument was calculated using Cronbach's alpha (r = .87).

The researcher trained six technicians from the Extension service to assist with data collection. The researcher and technicians averaged 60 interviews per week. The interviews were conducted during a five-week period in April and May 1989.

Data analysis involved correlational and descriptive statistics. Borich's formula (1980) was used to calculate the educational needs. The Pearson's r and point biseral coefficients were used to describe the degree of relationship between selected demographic characteristics of the farmers and their calculated educational needs and their preferences for particular teaching techniques.

Results

Characteristics of the Farmers

The mean age of the farmers is 42 years. Thirty-five percent of the farmers have no formal education. The majority of the farmers (82%) have government-owned land. The average size farm is 150 hectares with 42% of the farmers having between 50 and 199 hectares. Most of the farmers (84%) work full-time on their farms. Sixty-three percent of the farmers have their source of income from dairy products. Most of the farmers (71%) are 5 to 29 kilometers from the Extension office.

Agricultural Educational Needs

Educational need scores ranged from a mean of 3.01 to a mean of 11.71. A higher mean score indicates a greater educational need. Table 1 provides the ranks, means and standard deviations of the top 15 educational needs. As illustrated in Table 1, 14 of the top 15 educational needs were related to crop production practices and machinery management procedures.

Table 2 provides the ranks, means, and standard deviations of the bottom 15 educational needs. As shown in Table 2, the majority of the least important educational needs were related to livestock production and selected crop production practices.

Demographic Characteristics and Educational Needs

The third objective of the study was to determine the relationships between se-

Table 1

RANK ORDER OF THE TOP 15 EDUCATIONAL NEEDS

Items	Rank	Mean	S.D.
Operate different types of equipment, (plow, planters)	1	11.71	6.01
Perform proper machinery maintenance	2	10.89	5.59
Use artificial insemination	3	10.75	5.78
Determine control methods for crop pests	4	10.64	6.04
Determine control methods for crop diseases	5	10.51	6.04
Identify crop diseases	6	10.44	6.10
Interpret soil analysis to determine fertilizer needs	7	10.40	5.57
Maintain pastures	8	10.33	5.19
Keep maintenance records of machinery	9	10.31	5.31
Establish new pastures	10	10.30	4.95
Identify crop pests	11	10.30	5.63
Determine condition of stored forage crops	12	10.25	4.69
Take a soil sample	13	10.04	6.03
Determine amount of fertilizer needed	14	10.00	5.77
Select methods for forage storage	15	9.90	4.82

Table 2

RANK ORDER OF THE BOTTOM 15 EDUCATIONAL NEEDS

Item	Rank	Mean	S.D.
Determine control methods for weeds	57	7.57	5.35
Identify the feeds commonly used for animal rations	58	7.28	4.83
Milk cows with milking equipment	59	7.19	5.00
Determine best planting time for local weather conditions	60	7.16	5.14
Employ proper sanitation when milking	61	7.12	5.11
Select sires	62	7.07	4.86
Identify common weeds	63	7.00	4.81
Store seed	64	6.77	4.79
Store chemicals	65	6.74	5.36
Implant with growth stimulant	66	6.67	4.56
Utilize government assistance	67	6.49	4.36
Determine value of crop	68	5.89	4.73
Determine value of livestock	69	4.77	4.52
Dehorn cattle	70	3.26	4.99
Castrate beef calves	71	3.01	4.63

lected demographic characteristics of the farmers and their perceived educational needs in the four major agricultural areas. An overall educational need mean score was computed for each of the four areas. These mean scores were treated as interval data. Correlations coefficients were calculated between the four major mean scores of the calculated needs and the farmers' selected demographic characteristics.

Table 3 shows that there were moderate negative correlations between formal education and educational need scores in livestock production and machinery management. Farmers with less formal education had higher educational needs in the livestock production and machinery management areas. The remaining correlations between the selected characteristics of the farmers and educational need scores were either low or negligible.

Preferred Extension Teaching Techniques

The fourth objective was to identify selected Extension teaching techniques most preferred by the farmers. The farmers selected the top three methods that they most prefer for receiving technical information. Individual farm visits was the most preferred method, followed by field demonstrations and radio programs. The least preferred methods of receiving technical information were Extension bulletins and Extension magazines.

Teaching Techniques

The fifth objective was to determine the relationships between demographic characteristics and preferred teaching techniques. Table 4 illustrates that there was a low positive correlation (r = .29) between the size of the farm and the preference of the respondents for Extension magazines, indicating that farmers with more acreage have a greater tendency to prefer Extension magazines as a teaching technique. Findings also showed that there was a low positive correlation (r = .28) between years of farming experience, age, and the preference for office visits, indicating that older farmers with more experience are more likely to prefer office visits as a technique for receiving technical information. A low negative correlation (r = -.23) was found between distance from Extension office and preference for radio programs. Farmers who were a greater distance from the Extension office tended to prefer radio programs for receiving technical information.

Table 3

CORRELATION COEFFICIENTS BETWEEN THE FOUR MAJOR AREAS OF AGRICULTURE AND DEMOGRAPHIC CHARACTERISTICS OF FARMERS

	Livestock Production	Crop Production	Machinery Management	Farm Management
Age	.14	.10	.19	.18
Distance	.22	.10	.15	.01
Years Formal Education	-.30	-.27	-.34	-.13
Informal Education	-.24	-.22	-.26	-.07
Land Tenure	-.10	-.03	-.04	-.04
Size of the Farm	-.04	-.26	-.11	-.15
Full Time vs. Part Time	-.06	.09	-.02	-.01
Yrs. of Farming Experience	.13	.11	.13	.20

Table 4

CORRELATION COEFFICIENTS BETWEEN PREFERRED TEACHING TECHNIQUES LAND DEMOGRAPHIC CHARACTERISTICS OF FARMERS

	Ext. Bulletins	Office Visits	Farm Visits	Ext. Mtgs.	Ext. Mags.	Field demos.	Radio Progs.
Age	-.20	.27	.05	.05	-.18	-.07	.03
Formal Education	.14	-.14	.02	.01	.18	.01	-.01
Informal Education	.07	.21	-.11	-.04	-.14	-.01	.08
Type of Land Tenure	.22	-.05	.01	.04	.16	-.06	-.20
Size of the Farm	.04	.04	.11	-.01	.29	-.13	-.15
Full Time vs. Part Time	-.07	.10	.11	.02	.14	-.09	-.26
Years of Farming Experience	-.15	.28	-.01	.05	-.21	-.01	-.03
Distance from Ext. Office	-.02	.16	.07	.03	.04	.01	-.23

Preferred Time and Location

The sixth objective was to determine the most suitable time of the year and preferred location for receiving technical training. Farmers selected the months of January, February, and March as the most suitable months of the year to attend training activities. The best location was the farmers' own farms.

Conclusion, Implications, and Recommendations

From an analysis of the findings, four major conclusions are drawn: a) the farmer's highest educational needs are in machinery management and crop production, b) the educational needs scores and the demographic variables of the farmers are independent of one another, c) farmers prefer on-site farm visits, field demonstrations and radio programs for receiving technical information, and d) farmers prefer to receive technical information at their own farms during the summer months.

Educational Needs

Machinery management and crop production were the two areas that received the highest educational need scores. The lack of necessary information concerning the operation and maintenance of different kinds of machinery and equipment may be a possible explanation for the area of machinery management receiving the highest educational need scores. Farmers indicated a lack of knowledge in and an importance for disease and pest control, forage production, and fertilization practices.

From the above findings, the people involved in planning Extension programs for Santa Barbara County must realize that farmers need education in the general areas of machinery management and crop production. Extension programs will be more effective as planners focus on the identified educational needs of the farmers. Extension programs can provide information that will help the farmers to solve their problems and meet their educational needs in the areas of machinery management and crop production.

This study also ranked the educational needs for each item under the four major agricultural areas. This specific information should help Extension planners in placing their priorities on the items or competencies that were ranked high. Direct planning will help to meet the identified priorities, attract a wider audience, and lead to the success of the Extension program.

Santa Barbara County has an extension office and several governmental offices for rural and community development. The Extension agency and governmental offices should work together and use the findings of this study to create programs that will meet the needs and interests of the farmers in the county. In addition to beef and dairy, there are other enterprises in the county such as poultry, swine, sheep, and forestry. Educational needs in these areas could be identified through similar studies, which would help planners in developing additional Extension programs for selected farmers.

Demographic Characteristics and Educational Need Scores

The findings reveal that educational need scores and demographic characteristics are independent of one another. This finding implies that educational need scores of the farmers in Santa Barbara County are not a function of the demographic characteristics of the farmers. The data appear to indicate that the farmers surveyed have similar educational needs regardless of their age or other demographic characteristics.

Extension programs based on the educational need scores will serve the various groups of farmers. By knowing this information, Extension planners should not necessarily focus their programming on specific groups of farmers (e.g., younger farmers or large-acreage farmers) in Santa Barbara County. Extension planners should give priority to those items with the highest educational need scores specified in the study.

Technical Information Preferences

The third major finding was that farmers prefer on-site visits, field demonstrations, and radio programs for receiving technical information. Findings suggest that farmers prefer to receive technical agricultural information where they are living and working. Analysis of data revealed that 82% of the farmers are either illiterate or have low educational levels, and the majority (80%) live further than 10 kilometers from the Extension office. Farm visits will allow more personal contact between the Extension agent and the farmer, leading to more effective communication. Field demonstrations will provide direct, hands-on learning. Radio programs will provide technical information to farmers who cannot read or attend scheduled meetings and demonstrations. Extension planners should consider farm visits, field demonstrations, and radio programs as their main teaching techniques. The use of these teaching techniques will increase communication between farmers and agents which will facilitate the transference of agricultural information.

The Extension service should revise their programming and include these three teaching techniques as major sources for transferring information. Currently the Extension service in Santa Barbara County is not using radio programs as a teaching technique. The Extension service must concentrate on implementing radio programs and increasing farm visits and field demonstrations in delivering educational services to their clients. Farm visits require a great deal of time and effort, resulting in fewer farmers reached. The immediate solution would be to increase the number of Extension agents. Otherwise, agents presently employed should implement more field demonstrations and radio programs in order to reach more clients and leave farm visits to be utilized for those farmers with major problems.

Further study is needed to measure the educational effectiveness of the extension programs offered and teaching tech-

niques implemented. What the farmers may prefer as a teaching technique could be performed in such a way that would be detrimental to the program and the Extension service. For example, the agent is giving a demonstration with more lecture and lack of materials to demonstrate the practice and is interested only in providing the service and not in assuring that the farmers understand the information.

Place and Time of the Year for Receiving Technical Information

The fourth major finding was that farmers prefer to receive technical information at their own farms during the summer months. The explanation for this finding is that Venezuela has two seasons: rainy and dry. Since most of the roads in the county are made of gravel and soil, the only time that farmers can go out to receive technical information and be reached by the Extension agents is during the dry season. Similarly, the farm visits can only be done during the dry season because most of the roads are inaccessible during the rainy season. Farmers may prefer to receive technical information at their own farms because they feel more comfortable. The farmers may feel more free to ask questions or discuss their personal concerns, which will increase the possibility of meeting clientele's needs and interests.

Extension programmers must take into consideration that farmers need to be taught at their own farm and the best season to implement that teaching is during the dry season. Program planners should first consider those farmers with the least accessible roads and the farthest away from the extension office. During the summer months (dry season), Extension planners should allocate most of the technicians for field demonstrations and farm visits to attend to the educational needs, leaving radio programs to be offered throughout the entire year. During the rainy season, the Extension planners should give priorities to special problem cases and farmers that can be reached because the roads are accessible. This time also could be used to give training to the technicians in new agricultural practices or technology.

Further study must be done in determining the cost effectiveness of on-farm training. Further study is needed to identify farmers' preference and place for receiving technical information in the different sectors of the county. There are many differences among sectors that present different characteristics (e.g., better roads, hillside, flat lands, close to town, flooded most of the year).

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SUMMARY OF RESEARCH SERIES

Although educational program planning may be systematic, it is often based on institutional, political, traditional, or personal factors. To maximize the effectiveness of educational programs and to maximize the efficiency of human and monetary resources, programs must be based upon the specific needs of the client group. This is true in Venezuela, as in many Latin American countries. This study reports the perceived agricultural education needs of farmers in Santa Barbara County, Venezuela. It is also determined the Extension Teaching Techniques most preferred by the farmer and the most suitable time of the year and preferred location for receiving technical training. Extension personnel will find this information useful as they plan and target agricultural education programs.

This summary is based upon a master's thesis by Juan F. Rodriguez under the direction of Janet L. Henderson. Juan Rodriguez was a graduate student in the Department of Agricultural Education at The Ohio State University. He is currently the director for the Venezuelan Southwest Corporation; the corporation is involved in the agricultural and economic development of the region. Dr. Henderson is Associate Professor, Department of Agricultural Education, The Ohio State University. Special appreciation is due to Gary S. Straquadine, Utah State University; Steven Harbstreit, Kansas State University, and Jamie Cano, The Ohio State University for their critical review of the manuscript prior to publication.

Research has been an important function of the Department of Agricultural Education since it was established in 1917. Research conducted by the Department has generally been in the form of graduate theses, staff studies and funded research. It is the purpose of this series to make useful knowledge from such research available to practitioners in the profession. Individuals desiring additional information on this topic should examine the references cited.

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